Massachusetts Department of Public Health

Massachusetts Immunization Information System

MIIS HL7 Transfer Specifications
Version 2.6

Companion to

HL7 2.5.1 Implementation Guide for Immunization Messaging

10/16/2015

For use with:	Version
MIIS	3.5

Version History

VERSION	UPDATED	COMMENTS
1.0	2/25/11	Original document
2.0	2/10/2014	Add new code to Insurance Listing: Table UD01 "Other Private Insurance"
2.0	2/10/2014	Deprecated V06, V07 andV08 from VFC Listing: Table 0064
2.0	2/10/2014	Added Shot Level VFC to the OBX. Table NIP003
2.0	2/28/2014	Added CVX 160 and 801
2.1	8/15/2014	Added RXA-11 Administered at Location
2.1	8/15/2014	Added RXA-16 Substance Expiration Date
2.1	8/15/2014	RXA-21: Add Delete functionality to Action Codes.
2.1	8/15/2014	Added new MVX codes: MIP and KED
2.1	8/15/2014	Added Telecommunication Use Code: Table 0201
2.1	8/15/2014	Added Telecommunication Type Code: Table 0202
2.3	1/30/2015	CVX 111 : Status changed to Inactive
2.3	1/30/2015	Added CVX 161 : Flu-IIV4 Peds, p-free
2.3	1/30/2015	Removed funding source options that are not valid in Massachusetts (HL7 Table 0396)
2.3	1/30/2015	Added CVX 165 HPV9 and CVX 166 : Flu-IIV4-ID
2.3	1/30/2015	Added Medicare to Insurance Table (UD01) code 31
2.4	3/25/2015	Added CVX codes 162, 163 and 164
2.5	4/1/2015	Added Appendix V: Transport
2.6	10/14/2015	Clarified Demographic-only data requests, section 4.1.1 and 8.1.5
2.6	10/14/2015	Added MVX codes: PAX and MCM
2.6	10/14/2015	Updated CVX 39 to inactive

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1 Introduction

1.1 Background

The Massachusetts Department of Public Health has established the Massachusetts Immunization Information System (MIIS). As a secure, web-based system, the MIIS supports the tracking of vaccine administration within the Commonwealth. While the MIIS has a graphical user interface (GUI) allowing health care providers to enter, query, and update patient immunization records, the MDPH recognizes that some provider sites already store immunization data in their own electronic health record system (EHR). To best support these provider sites, the Executive Office of Health and Human Services has also implemented the Massachusetts Health Information Highway (MA HIway). The MA HIway has the capability to accept data from existing EHR systems in real time, thus eliminating the potential burden of duplicate data entry (e.g. entering information into existing EHR systems and then also into the MIIS). The MA HIway accepts HL7 version 2.5.1 vaccine messages and fulfills one component of the "meaningful use" criteria defined for provider sites by The Health Information Technology for Economic and Clinical Health Act (HITECH).

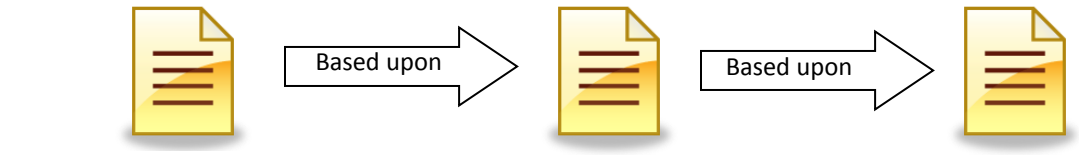
1.2 Purpose of This Document

This document should be read and understood by technical resources at provider sites who wish to establish connectivity between their Electronic Health Record System (EHR) and the MIIS. The document describes the following:

- General overview of the functionality of the MIIS MA HIway
- Technical Description of the MA HIway
- Description of the business logic used to process inbound HL7 messages
- Definition of the standard HL7 file format utilized by the MIIS

1.3 References

This document defines the specifications of data exchange specific to the MIIS and is meant as a companion to the following documents:



This document
MDPH:
MIIS HL7 Transfer Specifications

CDC:
Implementation Guide for
Immunization Messaging

HL7:
HL7 Messaging Standard

- **Implementation Guide for Immunization Messaging**. Published by the National Immunization Program within the Center for Disease Control and Prevention, this guide provides a national standard for states to implement HL7 messaging specific to immunization data. The guide describes how to implement messaging in compliance with the HL7 standard. It is listed as "HL7

Version 2.5.1: Implementation Guide for Immunization Messaging, Release 1.5 Published 11/05/2014" at the following website: http://www.cdc.gov/vaccines/programs/iis/technical-guidance/hl7.html

1.4 Acronyms

The following lists some of the acronyms used within this document:

Acronym	Definition
ACIP	Advisory Committee on Immunization Practices
ACK	Acknowledgment (HL7)
AIMS	Access and Identity Management Service
AIRA	American Immunization Registry Association
CDC	Center for Disease Control and Prevention
EHR	Electronic Health Record
EOHHS	Executive Office of Health and Human Services
GUI	Graphical User Interface
HIE	Health Information Exchange
HL7	Health Level Seven (Messaging standard)
IIS	Immunization Information System
MDPH	Massachusetts Department of Public Health
MIIS	Massachusetts Immunization Information System
SOAP	Simple Object Access Protocol
VG	Virtual Gateway
VIS	Vaccine Information Statement
VXU	Unsolicited Vaccination Update (HL7)
WSDL	Web Service Definition Language

2 Prerequisites for data exchange with the MIIS

The Massachusetts Health Information Exchange (MA HIway) uses the Direct Project standards and policies to implement a Direct based Health Information Exchange (HIE).

Instructions to transport using SOAP web services can be found on our website at : https://www.contactmiis.info/ehrIntegration.asp

If you are unable to connect using SOAP protocol and wish to explore other options, please send an email to Masshiway@state.ma.us, or call 1-855-MA-HIway (855-624-4929).

In order to exchange data with the MIIS, the following prerequisites should be met by each submitting system:

1. Ability to construct a valid HL7 2.5.1 VXU message.
2. Ability to populate HL7 message with all required fields.

3 Steps in Getting Qualified for Production Readiness

- By completing the HL7 checklist, the EHR vendor or Site IT will confirm ability to send all required HL7 data fields. In addition, a clinical champion will need to be identified at the provider site. This person will work with MDPH to complete registration, determine clinical workflows related to informing patients and training of end-users.
- The EHR vendor or Site IT will work directly with MDPH or the MA HIway to setup HL7 transport to the MIIS Certification/Test environment.
- The EHR vendor or Site IT will provide test messages directly from a production environment real-time. These messages will be reviewed for completeness and accuracy.
- Upon completion of both HL7 Readiness and Clinical readiness, production credentials will be provided.

4 Testing Overview

4.1 Step 1. EHR Sends HL7 Message

The MA HIway supports data exchange from EHR systems to the Mass HIway. The Mass HIway supports XDR soap and the SMIME protocols. The HL7 message is processed in real-time and an acknowledgement is sent to the initiating system as soon as the message processing is complete.

4.1.1 Triggers for EHR to send HL7 message

The trigger points for the originating EHR system to send a VXU update should be the following:

1. Any new vaccine currently administered at the provider site.
2. Any historic vaccine currently entered into the EHR system at the provider site, regardless of the source of immunization.
3. Any edits or updates to existing administered vaccines or related to the immunization event in the patient record in the provider's EHR system.
4. Any edits, updates or deletes to any information that has already been submitted to MDPH.
5. Any demographic update, such as address, telephone or email.

4.1.2 Historical Records

- Capturing Complete immunization histories within the MIIS yield accurate immunization forecasts since they are done using information from the entire immunization history.
- A one-time Flat File load of batched immunization histories from an EHR data base or a non-EHR historical archive is necessary. Please refer to the Flat File Transfer Specification guide, available on the ContactMIIS website (https://www.contactmiis.info).

4.1.3 Message Packaging and Processing Modes

MIIS data exchange has been designed to process messages in real-time, synchronous mode, and will handle a batch consisting of one HL7 record. Batches are wrapped in batch header and batch trailer segments, and should not exceed 1MB in size. In the current implementation, a batch will contain a single HL7 message with a single client record..

4.2 Step 2. MA HIway Receives and Authenticates HL7 Message

Each message must contain valid authentication credentials. As part of the HL7 connectivity implementation process, providers will be given an EHR specific system account. These system credentials will be provided in the header of the transmitted message. The authentication process is handled by Access and Identity Management Service (AIMS) which is part of the EOHHS infrastructure. If message authentication fails, messages will be rejected by the MA HIway.

4.2.1 Validate User ID and Password

The system shall validate the user ID and password contained within the inbound HL7 message.

- Authentication, Authorization and Auditing (AAA) Framework:
  - Validation of claim of Identify (Authentication)
  - Providing Access to a Web Service based on privileges (Authorization)
  - Process to verify that only authorized actors are granted access to resources (Auditing)

4.3 Step 3. MA HIway Validates HL7 Message

The system will validate the HL7 message construction and syntax according to the HL7 2.5.1 standard described in this document and in greater detail in HL7 Implementation Guide. HL7 encoding checks will be performed for each individual message in the batch, and if any messages do not pass validation, they will be rejected. Acknowledgment messages will be generated for each processed message.

4.4 Step 4. MA HIway Processes Valid Messages

4.4.1 Content Validation

After the messages pass the HL7 syntax and format validation, additional content validation for each segment and subcomponent is performed, to meet MIIS-specific rules described in this document. Messages may be rejected or flagged for further manual review if certain content does not meet requirements.

4.4.2 New Records and Updates to Existing Records

All immunization messages are sent as a VXU type HL7 message. Regardless of whether the message contains a new record or an update to an existing record, the MIIS requires a full VXU message to be sent with all required and recommended fields filled out. A full VXU message should be generated by the sending system for any updates to existing patient records, and should contain all segments, components, and subcomponents of a full message. The MIIS has a fully functional and configurable de-duplication algorithm that selects incoming records for comparison, compares a set of defined data elements, and takes actions to merge the records, present them for manual resolution, or maintain

them as separate records. Selection criteria and business rules for these algorithms follow AIRA and ACIP guidelines for data quality and MA Immunization Program requirements.

4.4.3 Deletes of Individual Shots or Full Records

Full client records may only be deleted by the MA Immunization Program; this functionality is not available to providers. Individual shots may be deleted by providers due to data entry error via HL7 (RXA-21=D), or marked invalid through the application's GUI.

4.4.4 Route Message

After messages have been processed and content has been validated against business rules, the message is routed to the target application. Routing is specified in the MSH segment of the message.

4.5 Step 5. The MIIS Application Sends Acknowledgements

The HL7 message ACK type will be generated by the MIIS application for each transmitted VXU message, whether it was successfully processed, failed, or was rejected along the way. Successful processing of HL7 message will result in technical acknowledgement that signifies that message was processed. Acknowledgment messages signifying failure will be generated only due to incorrect HL7 format or invalid content, not due to any infrastructure issues. ACK messages will supply a code in the MSA-1 subcomponent to signify Application Accept or Application Error.

Acknowledgment messages will be sent by the MA HIway to the external system in a synchronous mode. Since HL7 messages are processed in a real-time mode (synchronous), the ACK will be sent as soon as the message is accepted or rejected by the MA HIway or MIIS; this occurs within the same transaction session.

The lack of an acknowledgment message sent to the originating EHR system signifies an infrastructure issue, and requires the provider to re-send the messages. All other messages that generated a success acknowledgment will be stored in the MIIS. The hosting provider ensures that databases are backed up on the regular basis, and disaster recovery plans are in place to ensure that application is up and accessible 24/7.

5 MDPH Policy on Data Sharing in the MIIS

Massachusetts health care providers have a legislative mandate to report to the MA Department of Public Health (MDPH) the immunizations they administer, to have this information stored in the MIIS, and to inform patients or guardians of the MIIS and their right to object to having their data shared in the MIIS. Once patients have been informed of the MIIS and their right to object to data sharing, it is assumed that data sharing may occur unless the individual or parent/guardian fills out an objection form.

Objecting to data sharing in the MIIS would limit data access to the MDPH and the health care provider that has administered the vaccine; immunization data would not be shared across providers or visible to other public health agencies or partners. In the situation where an individual who had previously allowed data sharing changes their mind and objects to data sharing, only MDPH and the provider who changed the data sharing status to "No" will be able to access that individual's record.

Within the MIIS, there is a field that designates data sharing status with the value options of "Yes", "No" or "Unknown". This value can only be updated or changed via direct entry into the MIIS web application's graphical user interface (GUI).

An "Unknown" data sharing status value can only be assigned through historical data pre-loads – once a provider site is actively using the system, providers must discuss the MIIS with their clients and the client has the opportunity to object to data sharing (data sharing "No"). The designation of "Unknown" via historical pre-load will function equivalent to a "No" for data sharing, but will help both the MDPH and providers understand whether the client's data is not being shared in the MIIS because they have actively objected to data sharing or because they have not yet had a provider visit during which the MIIS was discussed. If the client does not object to data sharing, their status defaults to "Yes" once the provider site is activated in the MIIS (after the "Go-live" date).

Data sharing status of "No" can only be set manually through direct entry into the MIIS web application (GUI).

Users of the MIIS web application (GUI) will be able to set data sharing values directly in the application. If historical information is preloaded from billing systems or other practice management systems, their client's preference will be set to "Unknown" for data sharing. As providers use the system, after their "Go-live" date, entry of current immunizations will trigger the system to automatically set the client record to "Yes" for data sharing. If the client objects to data sharing then the provider will change the data sharing status field to "No" and must fax or mail a copy of the Objection form to the MDPH.

During data exchange with the practice's electronic medical record system, assignment of the data sharing status will differ based on whether or not the immunization was given (RXA-3) before or after the practice "Go-live" date with the MIIS. The reference date used to determine this value is stored as the "Go-live" date for each immunization provider. A "Go-live" date will only be available once a practice has established a systematic approach for informing patients about the MIIS and their right to object to data sharing.

For immunizations administered BEFORE "Go-live" date, the MIIS status is set to "Unknown". For immunizations administered AFTER "Go-live" date, the MIIS status is set to "Yes", provided that the

individual in question has not objected to data sharing in the system. A summary of this is shown in the table below.

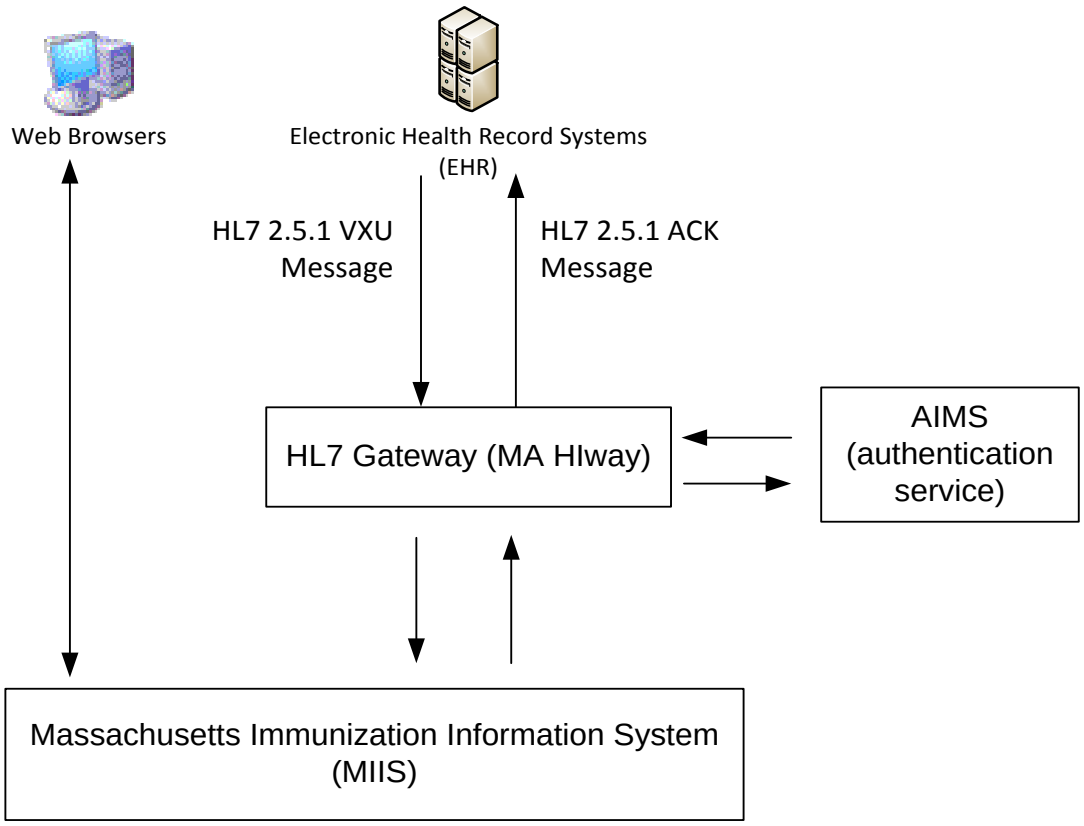
Vaccine Administration Date vs. Go-live Date	Current MIIS data sharing status	Final MIIS data sharing status
Before (Historic Immunizations)	None/Unknown	**Unknown**
Before (Historic Immunizations)	No	No (Don't Allow Sharing)
Before (Historic Immunizations)	Yes	Yes (Allow Data Sharing)
After (Current Immunizations)	None/Unknown	**Yes (Allow Data Sharing)**
After (Current Immunizations)	No	No (Don't Allow Sharing)
After (Current Immunizations)	Yes	Yes (Allow Data Sharing)

6 Technical Description of MIIS Data Exchange Infrastructure

This section provides a conceptual view of the MIIS architecture and a technical description about how to access the MA HIway.

6.1 Conceptual View

The following illustration depicts the high-level view of the data exchange.



EHR systems transmit messages to the MA HIway. After being authenticated and validated, the messages are then forwarded to the MIIS. After processing the data within the message, the MIIS will send an Acknowledgement message back (messages may indicate success or failure).

7 MIIS HL7 Message Specifications

The ANSI HL7 standard is widely used for data exchange in the health care industry. The full standard is quite lengthy, covering a variety of situations in patient care and health care finance and no single application is likely to use all of its content. The CDC has worked with Immunization Information Systems (IIS's) to create a set of HL7 messages that permit exchange of pertinent immunization data. This document covers the subset of HL7 that will be used for patient and immunization records exchanged between the MIIS and outside systems.

For more basic questions regarding HL7 format, please refer to the CDC website.

7.1.1 Sample HL7 Message

```
BHS|^~\&|
MSH|^~\&|EHR|12345^ABCDE
Pediatrics|MIIS|99990|20140701041038||VXU^V04^VXU_V04|MSG.Valid_01|P|2.5.1|||
PID|1||82223^^^AssigningAuthority^MR||TEST^PATIENT||20020303022142|F||2028-9^Asian^HL70005|543
Main St^^Anytown^^01111^^P||781-999-9999^PRN^PH^^1^781^9999999~978-999-
9999^WPN^PH^^1^781^9999999~^NET^X.400^email.test@gmail.com||||||||2135-2^HIspanic or
latino^CDCREC||||||||
PD1|||Sample Family Practice^^10144|NPI001^LastName^ClinicianFirstName^^^^Title||||||||||||A|
NK1|1|mother^patient|MTH^Mother^HL70063|5 elm st^^boston^^01234^^P|781-999-
9999^PRN^PH^^1^781^9999999|||||||||||||||||01^No remainder recall^HL70396
PV1|1|R|||||||||||||||||V01^20120901041038
IN1|1||8|Aetna Inc
ORC|RE||4242546^NameSpaceID|||||||||||||
RXA|0|1|20140901041038|20140901041038|141^FLU-TIV^CVX|0.5|ml^MilliLiter [SI Volume
Units]^UCUM||00^New
Immunization^NIP001|NPI001^LastName^ClinicianFirstName^^^^Title^^AssigningAuthority|14509||||L987||MS
D^Merck^MVX|||CP||20120901041038
RXR|C28161^Intramuscular^NCIT|LA^Leftarm^HL70163
OBX|1|CE|30956-7^SINGLE VACCINE TYPE^LN|1|88^IPV^CVX||||||F|||20140701041038
OBX|2|CE|30963-3^ VACCINE FUNDING SOURCE^LN|1|VXC2^STATE
FUNDS^HL70396||||||F|||20120901041038
OBX|3|CE|64994-7^Vaccine funding program eligibility category^LN|1|V01^Not
VFC^HL70064||||||F|||20140701041038
OBX|4|TS|29768-9^DATE VACCINE INFORMATION STATEMENT PUBLISHED^LN|1|20140601||||||F|||20140901
OBX|5|TS|29769-7^DATE VACCINE INFORMATION STATEMENT PRESENTED^LN|1|20140901||||||F|||20140901
BTS|1|
```

The details of how HL7 messages are constructed, for the MIIS purposes, will be explained later in this document. The example above shows the essentials of what a message looks like. In this example, a message is being sent on behalf of ABCDE with a provider organization id of '12345' to the MIIS. The message consists of three segments.

NOTE: ABCDE may or may not be the actual transmitter of the message. The transmitter of the message will be identified by the MIIS from log-in information and not from an HL7 message.

- The Message Header segment (MSH) identifies the sending application and the receiver (MIIS). It also identifies the message as being of type VXU. The VXU is an Unsolicited Vaccination Record Update, which is one of the message types defined by HL7.
- The Patient Identification segment (PID) gives the patient's name (Patient Test), birth date, and other identifying fields.
- The Pharmacy Administration segment (RXA) tells that a Flu vaccine, with CVX code 141, was administered on September 1, 2014 (formatted as 20140901). Some segments can be repeated within a single message. In this example, the message could have included a second RXA segment to record another immunization given.

7.1.2 Usage Code Interpretations for Fields, Components, and Subcomponents

Usage Code	Interpretation	Comment
R	Required	• **Reject, and generate error.** The MIIS will reject the message if the required element is absent or does not meet any data type and/or code set specifications within this document. None of the data within the message will be saved.

RE	Required but may be empty	• **Accept.** MIIS will not raise an error if the "RE" element is absent or does not meet any data type and/or code set specifications described in this document. The MIIS will process the message.
		• **RE and Optional Segments**
		  ◦ If an Optional Segment has a field marked "RE", but the sending application does not have a value to populate the RE field/s, then the segment should not be included.
		  ◦ If an Optional Segment is used, then fields marked "RE" are required to be valued with a valid value for that field if the EHR system captures the relevant data field.
		• The element may be missing from an occasional message, but must be sent by the sending application if there is relevant data.
		• A conforming sending application should be capable of providing **all** "RE" elements. If the conforming sending application knows the required values for the element, then it must send that element. If the conforming sending application does not know the required values, then that element may be omitted but MDPH should be notified for further guidance.

O	Optional	• **Accept without any errors.** MIIS will not raise an error if it receives an unexpected optional element, and will ignore the values if they do not meet specifications described in this document. • This element may be present if specified in local profile. Local partners may develop profiles that support use of this element. In the absence of a profile, conformant sending applications will not send the element.

CE	Conditional but may be empty	• **Accept.** MIIS will not raise an error if the "RE" element is absent or does not meet any data type and/or code set specifications described in this document. The MIIS will process the message. • This usage has an associated condition predicate. This predicate is an attribute within the message. If the predicate is satisfied: If the conforming sending application knows the required values for the element, then the application should send the element.

7.2 Rules for Message Construction

7.2.1 General Rules for Sending Systems

The following rules should be used by sending systems to construct HL7 messages.

- Each segment must begin with the 3-letter segment ID (for example RXA)
- Each field must begin with the data field separator ("|").
- BHS segment should be terminated with the data field separator ("|").
- Each segment is one line of text ending with the carriage return character, <CR>.
- The encoding characters are ("^~\&").
- The data fields must follow the order and data types specified by the segment structure definition.
- Non-Required fields that are not valued should still occupy the same field position in messages and be delimited by data field separator ("|"). Since later fields in the segment are encoded by ordinal position, fields that are not present do not reduce the number of field separators in the segment. For example, when the second and third fields are not present, the field separators maintain the ordinal position of the fourth field: |field1|||field4
- End each segment with the segment terminator (either the carriage return character, ASCII hex 0D, or <CR> tag).
- Treat data segments that are expected but not present as if all data fields in the segment were not present.
- Date data types (DT) must follow the following format: YYYYMMDD.
- Sending facility should have a valid **Vaccine Provider Identification Number (PIN)**, recognizable by MA DPH, and included in MSH-4.
- Each message must contain **exactly one** Patient Identification (PID) segment. Only **one** patient at a time may be sent in a message. This segments gives identifying detail about the patient and is used to find matching patients in the registry.
- The Pharmacy Administration (RXA) segment indicates that a single vaccination was given. Each message must contain at least **one or more** of these for each patient. For each RXA segment, the RXR segment must also be included to indicate where and how the vaccination was given. If no vaccine has been administered, RXA segment must specify the absence of immunization, as per rules described further in the document.
- Each RXA segment must be associated with one ORC segment, based on HL7 2.5.1 standard.

7.2.2 General Rules for Receiving Systems

The following rules are used by receiving systems (the MIIS and MA HIway) to process HL7 messages.

- HL7 2.5.1 is the format for acceptable messages. Any message that does not pass format validation will be rejected by the MA HIway.

- Messages that are missing values for segments and subcomponents denoted as required by HL7 standard or mandatory by the MIIS will be rejected. Certain required subcomponents may be part of an optional segment; if they are missing, the segment will be ignored. **Example:** NK1 segment is optional, but if it's present, NK1-2 is a required field that must be filled out
- Data segments that are expected but not present will be treated as if all data fields in the segment were not present.
- Any data segment or subcomponent that is included but not expected will be ignored, rather than treated as an error. The HL7 message types used by the MIIS may include many segments or subcomponent besides the ones in this document; the MIIS will ignore them.

7.3 General Error Conditions

The following table identifies some general error conditions and outcomes.

#	Condition	Outcome
1	HL7 2.5.1 format not followed.	Message rejected. Error ACK sent to sending system.
2	Required segment not present.	Message rejected. Error ACK sent to sending system.
3	Segments not in correct order. Each segment must be in the order specified by the message format.	Message rejected. Error ACK sent to sending system.
4	Segment not expected.	Message rejected. Error ACK sent to sending system.
5	Non-repeating segment is repeated.	Message rejected. Error ACK sent to sending system.
6	Required segment has required fields that are not present or rejected due to errors (e.g. data type or code set).	Message rejected. Error ACK sent to sending system.
7	Optional segment has required field that is not present or rejected due to errors.	Segment ignored and message processed. Success ACK sent to sending system.
8	Required field is not present.	Message Rejected. Error ACK sent to sending system.
9	Required field is rejected due to errors.	Message Rejected. Error ACK sent to sending system.
10	Code Set Mismatch. Incoming data value is not in the list of expected values for a field that is constrained to a list of values.	Incoming data are treated as empty. If field is required and blank, then reject message. Error ACK sent to sending system.
11	Data fields are found at the end of a data segment that are not expect.	Ignore extra fields at the end of the segment. Success ACK sent to sending system.
12	Data Type Mismatch.	Message rejected. Error ACK sent to sending system.
13	Field within a message has a total number of sub-components greater than those specified in the HL7 2.5.1 specification.	Message rejected. Error ACK sent to sending system.
14	Field within a message has populated valid subcomponents that are not listed in this requirements document.	Subcomponents ignored and message processed. Success ACK sent to sending system.

#	Condition	Outcome
15	Optional field that is not supported by MIIS processing is included in message.	Ignore optional field and process message. Success ACK sent to sending system.
16	Repeatable HL7 fields/components which are repeatable, but the MIIS field is not repeatable.	Use the first instance of the HL7 repeat, regardless of the repeat type (e.g. "Home", "Work", etc.).
17	Data Length Mismatch.	Message rejected. Error ACK sent to sending system.
18	Missing MSH segment, invalid values in MSH components, or missing delimiter between MSH components.	Message rejected. Error ACK sent to sending system, without Message Control ID.
19	Missing a carriage return at the end of the message (end of BTS segment).	Message rejected. Error ACK sent to sending system, without Message Control ID.
20	Issues with required fields of BHS segment.	Message rejected. Error ACK sent to sending system, without Message Control ID.

7.4 Segment Specifications

The following sections of this document present information about each segment and its requirements in the following table format:

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME

1	**SEQ**	The ordinal position of the field in the segment. Since the MIIS does not use all possible fields in the HL7 standard, these are not always consecutive.
2	**LEN**	Maximum length of the field.
3	**DT**	The HL7 data type of the field. See below for definition of HL7 data types.
4	**R/RE/O**	**R** means required by HL7.
		RE means required but may be empty.
		O means optional.
5	**RP**	**Y** means the field may be repeated any number of times.
		N means no repetition is permitted.
6	**TBL#**	Number of the HL7 table giving valid values for the field.
7	**MIIS USAGE**	Identifies the corresponding MIIS data field, or explains usage in the MIIS.
8	**ELEMENT NAME**	HL7 name for the field.

In addition, each segment is given a brief description excerpted from the HL7 standard. The tables define what fields make up each segment. Since the MIIS does not use all the fields that HL7 defines, there are sometimes gaps in the ordinal sequence of fields. Following HL7 rules, the gaps do not diminish *the number of field separators within the segment.* For example, if the second and third fields in a segment are not present, their field separators must remain in order to indicate that the next field present is the fourth: field1|||field4

For fields that require to be populated with specific value, the information will be noted in the following way:

Required Default Value	**ABCDE**

8 Message Definition: VXU Message

VXU Message in HL7 stands for Unsolicited Vaccination Update. The VXU is used for sending new and/or updated patient demographic and/or immunization record information. The MIIS supports the receipt and processing of a batch VXU message with the batch containing **one and only one message**.

8.1.1 VXU Batch Segment Structure

The segments that are documented here are sufficient to support the principal MIIS functions of storing data about patients and immunizations.

In the table below, **Cardinality** refers to the indicator of the minimum and maximum number of times the element may appear.

- **[0..0]** Element never present.
- **[0..1]** Element may be omitted and it can have at most, one occurrence.
- **[1..1]** Element must have exactly one occurrence.
- **[0..n]** Element may be omitted or may repeat up to n times.
- **[1..n]** Element must appear at least once, and may repeat up to n times.
- **[0..*]** Element may be omitted or repeat for an unlimited number of times.
- **[1..*]** Element must appear at least once, and may repeat unlimited number of times.
- **[m..n]** Element must appear at least m and, at most, n times.

Segment	Cardinality	Usage	Comment
BHS	[1..1]	**R**	**Batch Header Segment**. The system supports the sending of one and only one message per batch. This functionality may change in the future.
MSH	[1..1]	**R**	**Message Header**. Every message begins with an MSH.
PID	[1..1]	**R**	**Patient Identification**. Every VXU has one PID segment.
PD1	[0..1]	RE	**Patient Additional Demographic**. Every PID segment in VXU may have one or less PD1 segment
NK1	[0..*]	RE	**Next of Kin/Associated Parties**. The PID segment in a VXU may have zero or more NK1 segments.
PV1	[0..1]	RE	**Patient Visit**. The PID segment in a VXU may have zero or one PV1 segment. Subsequent messages regarding the same patient/client

			may have a different PV1 segment.
IN1	[0..1]	O	**Insurance.**
ORC	[1..*]	**R**	**Order Request**. The order group in a VXU may have one or more ORC segments. ORC segments are required for each RXA segment, even if the Filler Order Number is the same.
RXA	[1..1]	**R**	**Pharmacy/Treatment Administration**. Each ORC segment in a VXU must have one RXA segment. Every RXA requires an ORC segment.
RXR	[0..1]	RE	**Pharmacy/Treatment Route**. Every RXA segment in a VXU may have zero or one RXR segments.
OBX	[0..*]	RE*	**Observation/Result**. Every RXA segment in a VXU may have zero or more OBX segments. *Note that certain OBX segments are required for newly administered vaccines.
BTS	[1..1]	**R**	**Batch Trailer Segment.**

8.1.2 BHS - Batch Header Segment (REQUIRED AND NOT REPEATABLE)

The BHS segment defines the start of a single patient record.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	**1**	**ST**	**R**	N		**Standard HL7**	**Batch Field Separator**
2	**3**	**ST**	**R**	N		**Standard HL7**	**Batch Encoding Characters**
3	20	HD	O	N		Validate External Site	Batch Sending Application
4	20	HD	O	N		MDPH Vaccine PIN	Batch Sending Facility
5	20	HD	O	N		Establish Routing	Batch Receiving Application
6	20	HD	O	N		Establish Routing	Batch Receiving Facility
7	26	TS	O	N			Batch Creation Date/Time
9	20	ST	O	N			Batch Name/ID/Type
11	20	ST	O	N			Batch Control ID
12	20	ST	O	N			Reference Batch Control ID

BHS-1 This field contains the separator between the segment ID and the first real field, BHS-2-batch encoding characters. As such it serves as the separator and defines the character to be used as a separator for the rest of the segment. The MIIS requires | (ASCII 124). This is a required field.

Required Default Value (BHS-1)	**|**

BHS-2 This field contains the four characters in the following order: the component separator, repetition separator, escape characters and sub-component separator. The MIIS requires ^~\&, (ASCII 94, 126, 92 and 38 respectively). This is a required field.

Required Default Value (BHS-2)	**^~\&**

BHS-3 Used to identify the technical gateway application sending this batch of records.
BHS-4 Used to identify the site sending this batch of records.
BHS-5 Used to identify receiving application for this batch.

Required Default Value (BHS-5)	**MIIS**

BHS-6 Used to identify receiving facility for this batch.

Required Default Value (BHS-6)	**99990**

BHS-7 Unique Date and Time stamp for this batch.
BHS-9 Free text, which may be included for convenience, but has no effect on processing.
BHS-11 This field is used to uniquely identify a particular batch. It can be echoed back in BHS-12-reference batch control ID if an answering batch is needed. For the MIIS purposes, the answering batch will contain ACK messages.
BHS-12 This field contains the value of BHS-11-batch control ID when this batch was originally transmitted. Not present if this batch is being sent for the first time. See definition for BHS-11-batch control ID.

8.1.3 BTS - Batch Trailer Segment (REQUIRED AND NOT REPEATABLE)

The BTS segment defines the end of a batch.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	10	ST	O	N		Number of records	Batch Message Count
2	80	ST	O	N			Batch Comment

BTS-1 This field contains the count of the individual messages contained within the batch.
BTS-2 Free text, which can be included for convenience, has no effect on processing.

8.1.4 MSH – Message Header Segment *(REQUIRED AND NOT REPEATABLE)*

The MSH segment defines the intent, source, destination and some specifics of the syntax of a message. The MSH is specific to each, single immunization record and the specific clinical site responsible for the associated record.

The Message Header Segment for ACK will have the same number of fields as the VXU MSH. For ACK, the values in the fields will reflect information about a previously received, single record. The data types for each component and sub-component are the same for VXU MSH and the ACK MSH. Wherever default values are expected, the distinction will be made between VXU and ACK requirements (e.g. MSH-9).

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	**1**	**ST**	**R**	**N**		**Standard HL7**	**Field Separator**
2	**4**	**ST**	**R**	**N**		**Standard HL7**	**Encoding Characters**
3	20	HD	R	N		Validate External Site	Sending Application
4	**20**	**HD**	**R**	**N**		**MDPH Vaccine PIN**	**Sending Facility**

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
5	**30**	**HD**	**R**	**N**		**Establish Routing**	**Receiving Application**
6	**30**	**HD**	**R**	**N**		**Establish Routing**	**Receiving Facility**
7	**26**	**TS**	**R**	**N**		**Unique Time Stamp**	**Creation Date/Time**
9	**15**	**MSG**	**R**	**N**		**Identify message type**	**HL7 Message Type**
10	**20**	**ST**	**R**	**N**		**Unique message ID**	**Message Control ID**
11	**3**	**PT**	**R**	**N**			**Processing ID**
12	**20**	**VID**	**R**	**N**		**Standard HL7**	**Version ID**
15	2	ID	RE	N	0155		Accept Acknowledgment Type

MSH-1 Determines the field separator in effect for the rest of this message. This is a required field.

Required Default Value (MSH-1)	**|**

MSH-2 Determines the component separator, repetition separator, escape character, and sub-component separator in effect for the rest of this message. The recommend delimiters for immunization messages are <CR>=Segment terminator;, "|" = Field Separator, '^' =Component Separator; '&' = Sub-Component Separator; '~' Repetition Separator; and '\' = Escape Character. Field values of composite data types consist of several components separated by the component separator, "^". When components are further divided into sub-components, these are separated by the sub-component separator, "&". Some fields are defined to permit repetition separated by the repetition character, "~". When these special characters need to be included within text data, their special interpretations are prevented by preceding them with the escape character, "\". This is a required field.

Required Default Value (MSH-2)	**^~\&**

MSH-3 Identifies the application that sent the electronic record or batch of electronic records. This is a required field.

MSH-4 Identifies the Vaccine Provider Identification Number (PIN) of the sending facility. This value is assigned by the MIIS staff for reach clinical site during implementation. This is a required field.

MSH-5 This field uniquely identifies the receiving application. This is a required field.

Required Default Value (MSH-5)	**MIIS**

MSH-6 This field identifies the organization responsible for the operations of the receiving application. This is a required field.

Required Default Value (MSH-6)	**99990**

MSH-7 Date and time the message was created. The degree of precision must be at least to the minute, and the time zone must be included (format YYYYMMDDHHMM[SS[.S[S[S[S]]]]]+/-ZZZZ). This is a required field.

MSH-9 Two components of this field give the HL7 message type and the HL7 triggering event. Within HL7, the triggering event is considered to be the real-world circumstance causing the message to be sent. MSH-9.1 is used to denote Message Type (i.e. VXU), MSH-9.2 denotes triggering event (i.e. V04), and MSH-9.3 denotes Message Structure (i.e. VXU_V04). This is a required field.

Required Default Value (MSH-9)	**VXU^V04^VXU_V04** (for VXU) **ACK^O01^ACK_O01** (for ACK)

MSH-10 The message control ID is a string (which may be a number) uniquely identifying the message among all those ever sent by the sending system. It is assigned by the sending system and echoed back in the ACK message sent in response to identify the specific record which contains errors. It is important to have this be an ID that the provider can use to identify the patient record. This is a required field.

MSH-11 The processing ID is reserved by the MIIS for future use, but is required by HL7 standard. This is a required field.

Required Default Value (MSH-11)	"**P**" for production processing and "**T**" for testing.

MSH-12 For the parser, the version number that is read in the first MSH segment, of the file, will be the version assumed for the whole file. Current version of the MIIS will only accept "2.5.1". If there is no version number found in the first MSH segment, a hard error will occur and the file will not be processed. This is a required field.

Required Default Value (MSH-12)	**2.5.1**

MSH-15 This field identifies the conditions under which accept acknowledgments are required to be returned in response to this message. MIIS will ignore this, since ACK will always be sent. Refer to Accept Acknowledgment Type: MSH-15 (HL7 Table 0155) for values.

8.1.5 PID – Patient Identifier Segment *(REQUIRED AND NOT REPEATABLE)*

The PID segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

The MIIS can support the receipt of VXU messages for demographic-only updates. In such cases, the RXA segment is still required, but the CVX code must = 998.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	4	SI	RE	N		Standard HL7	Set ID
3	**20**	**CX**	**R**	**N**		**Client's MRN**	**Patient Identifier List**
5	**250**	**XPN**	**R**	**Y**	**0200**	**Client's Name**	**Patient Name**
6	250	XPN	RE	N		Mother's Maiden Name	Mother's Maiden Name
7	**26**	**TS**	**R**	**N**		**Client's DOB**	**Date/Time of Birth**
8	1	IS	RE	N	0001	Client's Gender	Administrative Sex
10	250	CE	RE	Y	0005	Client's Race	Race
11	250	XAD	RE	Y	0190	Client's Address	Patient Address
13	40	XTN	RE	Y		Client's Home Phone	Phone Number - Home

22	250	CE	RE	N	0189	Client's Ethnicity	Ethnic Group
29	26	TS	RE	N		Client's Death Date	Patient Death Date
30	1	ID	RE	N	0136	Patient Status	Patient Death Indicator

PID-1 This field contains the number that identifies this transaction. For VXU, the value will always be 1, since there could only be 1 PID segment for each patient.

Required Default Value (PID-1)	**1**

PID-3 This field contains the identifier used by the healthcare facility to uniquely identify a patient. The MIIS will only recognize a Medical Record Number, marked by type "MR". If type is not specified, the number will be assumed to be a Medical Record Number. If more than one number is used, any number identified by an ID type using other than MR will be ignored. This is a required field.

Example Using the CX data type showing Patient ID, Check Digit and ID type value "MR"
PID|1||121-2201001^1^^^MR|

Required Default Value (PID-3)	**MR**

PID-5 This field contains the names of the patient, followed by the name type code. Refer to Patient/Caregiver Name Type: PID-5 (HL7 Table 0200) for valid values. When only one surname and one family name are found in this field, those names will be considered the primary, legal names. Although this is a required field, middle name, suffix, and/or alias are optional and only first and last names are required.
If multiple iterations of name are sent, MIIS will prioritize based on PID-5.7 Name Type

1. If any patient names have a type of "L" – legal, take the first "L" type
2. Else (if no patients names are of "L" type), take the first value regardless of type

PID-6 This field contains the family name under which the mother was born (i.e., before marriage).
PID-7 This field contains the patient's date and time of birth. This date should be less than current date and time, and cannot be in the future. This is a required field.
PID-8 This field contains the patient's sex. Refer to Administrative Sex: PID-8 (HL7 Table 0001) for values. This is a required field.
PID-10 This field refers to the patient's race. Refer to Race: PID-10 (HL7 Table 0005) for values.
PID-11 This field contains the mailing address of the patient, followed by the address type. Refer to Patient Address Type: PID-11 (HL7 Table 0190) for values. If multiple addresses for the same person are provided, only the first one will be saved in MIIS.

PID-13 This field contains the patient's personal phone numbers and email address. PID-13.2 will determine the type of phone number. Refer to HL7 Table 0201 - Telecommunication Use Code and HL7 Table 0202 - Telecommunication Equipment Type for valid values of RXA-2 and RXA-3.
Each telecommunication shall be in iots own repetition, comprised of 13.2, 13.3, 13.6 and 13.7. In the absence of 13.6 and 13.7, the system shall use 13.1, if populated.
See sample format on page 16.

PID-22 This field contains the patient's ethnic group. Refer to Ethnic Group: PID-22 (HL7 Table 0189) for values. The third triplet of the CE data type for ethnic group (alternate identifier, alternate

text, and name of alternate coding system) is reserved for governmentally assigned codes. The MIIS supports repetition of this field.

PID-29 This field contains the patient's date and time of death. This date cannot be in the future. A valid value in this field will set the Patient Status in MIIS to "Inactive – Deceased" and will lock the record for further editing.

PID-30 This field indicates whether the patient is deceased. Refer to Yes/No Indicator: PID-30 (HL7 Table 0136) for valid values. The "Y" value will set the Patient Status in MIIS to "Inactive – Deceased" for all associated provider sties and will lock the record for further editing.

8.1.6 PD1 – Demographic Segment (*OPTIONAL AND NOT REPEATABLE*)

The PD1 segment carries additional patient demographic information that is likely to change. This segment is optional, and if any fields are absent or not formatted correctly, MIIS will ignore them but will still process the rest of the HL7 message.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
3	250	XON	O	N		MRN Facility	Patient Primary Facility
4	250	XCN	O	N		PCP Name	PCP Name and ID
16	2	IS	RE	N	0441	Client's Status	Immunization Registry Status

PD1-3 This field contains the name and identifier that specifies the "primary care" healthcare facility selected by the patient, and should contain a Vaccine Provider Identification Number (PIN) of the facility. If this number matches the one in MSH-4, then this facility will be set as the Primary Care Facility for the patient, and will be associated with MRN number in PID-3. If the number here does not match MSH-4 or is missing, the Facility set in MSH-4 is still associated with the patient, but is not marked as a Primary Care Facility.

PD1-4 This field is an identifier for primary care provider.

PD1-16 This field identifies the current status of the patient in relation to the sending provider organization. Refer to Immunization Registry Status: PD1-16 (HL7 Table 0441) for values. This field captures whether the sending provider organization considers this an active patient.

8.1.7 NK1 – Next of Kin Segment *(OPTIONAL* AND REPEATABLE)*

*Caregiver information is required for new shots, unless your EHR does not capture this data.

The NK1 segment contains information about the patient's other related parties. Any associated parties may be identified. For any single record, the NK1 segment can repeat to carry information about multiple care givers associated with this patient. This segment is optional and repeatable, and if any fields are absent or not formatted correctly, MIIS will ignore them but will still process the rest of the HL7 message.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	**4**	**SI**	**R**	**Y**		**Standard HL7**	**Set ID**
2	**250**	**XPN**	**R**	**Y**	**0200**	**Caregiver's Name**	**Name**
3	60	CE	RE	Y	0063	Caregiver Type	Relationship
4	250	XAD	RE	Y		Caregiver's Address	Address
5	40	XTN	RE	Y		Caregiver's Phone	Phone Number

22	2	CE	O	N	0215	Reminder/Recall	Publicity Code

NK1-1 This field contains the number that identifies this NK1 segment among additional NK1 segments (if present). For the first occurrence of the segment, the sequence number shall be one, for the second occurrence, the sequence number shall be two, etc.

NK1-2 This field contains the name of the next of kin or associated party, followed by the name type. Multiple names for the same person are allowed, but the legal neame must be sent in the first sequence. Refer to Patient/Caregiver Name Type: PID-5 or NK1-2 (HL7 Table 0200) for values. If there is only a single name, it is assumed to be the legal name of this single care giver and does not need a name type identifier. If there is more than one name, then identifiers are required for both or all names.

NK1-3 This field contains the actual personal relationship that the next of kin/associated party has to the patient. Refer to Next of Kin Relationship: NK1-3 (Subset of HL7 Table 0063) for values.

NK1-4 This field contains the address of the next of kin/associated party. Multiple addresses are allowed for the same person. The mailing address must be sent in the first sequence. If the mailing address is not sent, then the repeat delimiter must be sent in the first sequence.

NK1-5 This field contains the telephone number of the next of kin/associated party. Multiple phone numbers are allowed for the same person. The primary telephone number must be sent in the first sequence. If the primary telephone number is not sent, then the repeat delimiter must be sent in the first sequence. Secondary phone numbers (mobile, business, etc.) should be included in this field, if available.

NK1-22 Controls whether reminder/recall notices are sent. Refer to Publicity Code: PD1-11 and NK1-22 (HL7 Table 0215) for values. The MIIS will recognize “01” to indicate no reminder/recall notices or “02” reminder/recall notices any method.

8.1.8 PV1 – Patient Visit Segment (*OPTIONAL AND NOT REPEATABLE*)

The PV1 segment is used to convey visit specific information. The primary use in immunization messages is to carry information about the client’s eligibility status. This segment is optional, and if any fields are absent or not formatted correctly, MIIS will ignore them but will still process the rest of the HL7 message.

It is mandatory to report VFC status. Shot level VFC is now reported in the OBX. You may also report VFC in the PV1.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	4	SI	O	Y		Standard HL7	Set ID
2	1	IS	RE	Y		Standard HL7	Patient Class
20	50	FC	RE	Y	0064	Client’s VFC Status	Financial Class (VFC Status)

PV1-1 This field contains the number that identifies this PV1 segment among additional PV1 segments (if present). Current implementation of MIIS requires that there is only one PV1 segment.

Required Default Value (PV1-1)	**1**

PV1-2 This field is required by HL7 but ignored by the MIIS. Mark this as an R for recurring patient.

Required Default Value (PV1-2)	**R**

PV1-20 This field contains the financial class(es) assigned to the patient. It reflects the current eligibility status. For children, this will include the eligibility status for the Vaccines for Children program (VFC). This field has 2 components: financial class and date. The date is the date that the status was assessed. Refer to Financial Class: PV1-20 (HL7 Table 0064) for values.
NOTE: Providers that are able to categorize their patients' insurance coverage as "Medicaid", "non-Medicaid", or "self-paid" may use the following logic:
Non-Medicaid – use code V01 (Not VFC eligible)
Medicaid – use code V02 (VFC eligible)
Self-Paid – use code V03 (VFC eligible)

8.1.1 IN1 – Insurance Segment (OPTIONAL AND REPEATABLE)

Insurance information is requested for newly administered shots, unless your EHR does not capture this data.

The IN1 segment contains information about the patient's health insurance. This segment is optional, and if any fields are absent or not formatted correctly, MIIS will ignore them but will still process the rest of the HL7 message.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
3	2	XON	RE	N	UD01	Insurance	Insurance Company ID Number
4	250	ST	O	N			Insurance Company Name

IN1-3 This field contains the ID number of the health insurance company. Name must match one of the values in the insurance company table processed by the MIIS, or will be ignored. No partial matches will be processed. Refer to Insurance Company Name: IN1-3 (User-defined table UD01) for values.
IN-4 This field contains the name of the insurance company.
NOTE: Providers that are able to categorize their patients' insurance coverage as "Medicaid", "non-Medicaid", or "self-paid" may use the following logic in the PV1-20 field for FVC eligibility:
Non-Medicaid – use code V01 (Not VFC eligible)
Medicaid – use code V02 (VFC eligible)
Self-Paid – use code V03 (VFC eligible)

8.1.2 ORC – Order Request Segment (*REQUIRED AND REPEATABLE*)

The Common Order segment (ORC) is used to transmit fields that are common to all orders (all types of services that are requested). While not all immunizations recorded in an immunization message are able to be associated with an order, each RXA must be associated with one ORC, based on HL7 2.5.1 standard. If the RXA segment is coded with "No vaccine administered", then the ORC-3 shall be **9999**.
Example: ORC|RE|9999||||||||| This segment is required and repeatable, and if any fields are absent or not formatted correctly, then the system shall reject that particular segment along with associated RXA and RXR segments, but still process the rest of the message, including any other repeat ORC

segments. If the message does not have at least one valid ORC segment, then the entire message will be rejected.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	**2**	**ID**	**R**	**Y**		**Standard HL7**	**Order Control**
3	**75**	**EI**	**R**	**Y**		**Used for message processing**	**Filler Order Number**

ORC-1 Determines the function of the order segment. The value for VXU shall be RE.

Required Default Value (ORC-1)	**RE**

ORC-3 The filler order number is used to uniquely identify this immunization event among all immunization event histories sent by a single provider organization that "filled the order"; that is, who gave the immunization. Use of this unique identifying key will allow the initiating sending system to accurately identify the previously sent immunization record, facilitating update or deletion of that record. In the case where a historic immunization is being recorded (i.e. from an immunization card), the sending system SHALL assign an identifier as if it were an immunization administered by a provider associated with the provider organization owning the sending system. In the case where an RXA is conveying information about an immunization which was **not given** (e.g. refusal) the filler order number shall be **9999**.

8.1.3 RXA - Pharmacy/Treatment Administration Segment *(REQUIRED AND REPEATABLE)*

The RXA carries pharmacy/immunization administration data. It is a child of an ORC segment, which is a repeating segment in the VXU message. Because ORC are allowed to repeat, an unlimited numbers of vaccinations may be included in a message. Each RXA must be preceded by an ORC. Only one RXA segment is required and permitted per each ORC segment. If no vaccine has been administered, the RXA segment will reflect the following: **RXA|0|1|20090412|20090412|998^No vaccine administered^CVX|999**

We can accept demographic-only updates by coding RXA-5 = 998

This segment is required and repeatable, and if any fields are absent or not formatted correctly, then the system shall reject that particular segment, but still process the rest of the message, including any other repeat RXA segments. If the message does not have at least one valid RXA segment, then the entire message will be rejected.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	**4**	**NM**	**R**	**N**		**Standard HL7**	**Give Sub-ID Counter**
2	**4**	**NM**	**R**	**N**		**Standard HL7**	**Administration Sub-ID Counter**
3	**26**	**TS**	**R**	**N**		**Vaccination Date**	**Date/Time Start of Administration**
5	**100**	**CE**	**R**	**N**	**UD02**	**CVX Code**	**Administered Code (CVX)**
6	**20**	**NM**	**R**	**N**		**Vaccine Dose**	**Administered Amount**
7	60	CE	RE	N		Units	Administered Units
9	200	CE	RE	Y	0001	Record Source	Administration Notes

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
10	200	XCN	RE	N		Administered By	Administering Provider
11	200	LA2	C(RE/O)	N		Site shot given	Administered at Location
15	20	ST	RE	Y		Lot Number	Substance Lot Number
16	26	TS	C(RE/O)	N		Expiration Date	Substance Expiration Date
17	200	CE	RE	Y	0227	Vaccine Manufacturer	Substance Manufacturer Code
18		CE	C(R/X)	N	NIP002	Refusal Reason	Substance Refusal Reason
20	2	ID	RE	N	0322	Complete Dose	Completion Status
21	2	ID	RE	N	0323	Action Code	Action Code

NOTE: Special logic for setting **Vaccine Group** for combination vaccines.
MIIS sets the vaccine group for combination vaccine to the first Vaccine Group listed in the combo-vaccine's name:

Combination Vaccine Name	Vaccine Group Assigned
DTaP-Hib-HepB	DTP/aP
HepA-HepB Adult	HepA
DTaP-HepB-IPV	DTP/aP
DTaP-Hib-IPV	DTP/aP
DTaP-IPV	DTP/aP
Rubella-Mumps	M,M,R Component(s)
Measles-Rubella	M,M,R Component(s)
DTaP-Hib	DTP/aP
HepB-Hib	HepB
MMRV	MMR

RXA-1 This field is used to match an RXA. Constrain to 0 (zero).

Required Default Value (RXA-1)	**0**

RXA-2 This field is used to track multiple RXA under an ORC. Since each ORC has only one RXA in immunization messages, constrain to 1. This should not be used for indicating dose number, which belongs in an OBX.

Required Default Value (RXA-2)	**1**

RXA-3 The date this vaccination occurred.
RXA-5 This field identifies the medical substance administered. If the substance administered is a vaccine, CVX codes should be used in the first triplet to code this field. Refer to CVX Code: RXA-5 (User-defined table UD02) for values. The MIIS will only process CVX codes, which is the required code system. If no vaccine has been administered, CVX code of 998 should be used.
Example: RXA|0|1|20090412|20090412|998^No vaccine administered^CVX|999

RXA-6 This field records the amount of pharmaceutical administered. The units are expressed in the next field, RXA-7. If the dose is unknown, or if systems do not collect the administered amount, the value "**999**" should be recorded in this field.

RXA-7 This field is conditional because it is required if the administered amount code does not imply units. The MIIS will only process ML. This field is not required if the previous field is populated with 999. If the field is empty, the MIIS will assume the units are milliliters.

Required Default Value (RXA-7)	**ML**

RXA-9 This field is used to indicate whether this immunization record is based on a historical record or was given by the reporting provider. The first component shall contain the code, the second the free text and the third shall contain the name of the code system. Refer to Immunization Information Source: RXA-9 (HL7 NIP001 table) for values.

- NOTE: If this field is left blank, the immunization will be recorded as administered (i.e. owned by the sending organization) in the MIIS. All immunizations that were administered in your provider office should be recorded as "00" to ensure that the record is correctly associated with your organization in the MIIS.

RXA-10 This field is intended to contain the name and provider ID of the person physically administering the pharmaceutical. This field may also contain The National Provider Identifier (NPI), if it is available.

RXA-11 This field contains the site/clinic where the vaccine was administered, This field is conditional depending on whether the shot was administered by your organization. If the first occurrence of RXA-9.1 is valued "00" and RXA-20 is valued "CP" or "PA". RXA-11.4.2 will equal the Vaccine PIN of the administrating site.

RXA-15 This field contains the lot number of the medical substance administered. It may remain empty if the dose is from a historical record.

RXA-16 This field contains the expiration date of the medical substance administered. This field is conditional, depending on whether the shot was administered by your organization. If the first occurrence of RXA-9.1 is valued "00" and RXA-20 is valued "CP" or "PA"**RXA-17** This field contains the manufacturer of the medical substance administered. For vaccines, code system MVX should be used to code this field. Refer to Substance Manufacturer Name: RXA-17 (HL7 table 0227) for values. Sites should only submit the first subcomponent, RXA 17-1, the Manufacturer Code. Do not submit a "Description" in sub component 17-2. For component 17-3, a valid Name of coding system is acceptable.

RXA-20 This field indicates if the dose was successfully given. If a dose was not completely administered or if the dose were not potent this field may be used to label the immunization. Use the value "PA" for doses which are partially administered. A partially administered dose can refer to a scenario where the patient jumps and the needle breaks, or a dose using any other vaccine administration method, like inhalers results in an unknown quantity of vaccine entering the patient's system. If the value is "PA" for Partially Administered, then the MIIS sets the value of Incomplete Dose=Yes. If Completion Status = "NA" for Not Administered, then only that immunization will not be saved by the system. The rest of the information in the HL7 message will be saved
Refer to Completion Status: RXA-20 (HL7 Table 0322) for values.

RXA-21 This field indicates the action expected by the sending system. It can facilitate Add, Update or Deletion of immunization records. If left empty, the usage code will default to Add/Update. MDPH requires that sites have the ability to send updated data. **Your EHR must demonstrate during testing that updated and deleted shots can be recorded and sent to MDPH**.

8.1.4 RXR - Pharmacy/Treatment Route Segment *(REQUIRED AND NOT REPEATABLE)*

The Pharmacy/Treatment Route segment contains the alternative combination of route, site, administration device, and administration method that are prescribed as they apply to a particular order. This segment is required for new shots, but optional for historical shots.,. If any fields are absent or not formatted correctly, the MIIS will ignore them but will still process the rest of the HL7 message.
Example **C28161^**Intradermal^HL70162

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	**60**	**CE**	**R**	**N**	**0162**	**Vaccine Route**	**Route**
2	60	CWE	RE	N	0163	Vaccine Site	Administration Site

RXR-1 This field is the route of administration. Refer to Route: RXR-1 (HL7 Table 0162) for values.
RXR-2 This field contains the site of the vaccine administration. Refer to Administration Site: RXR-2 (HL7 Table 0163) for values.

8.1.5 OBX – Observation Result Segment *(REQUIRED AND REPEATABLE)*

The observation result segment has many uses. It carries observations about immunization event/visit associated with the RXA segment. The basic format is a question (OBX-3) and an answer (OBX-5). This segment is required and repeatable for new shots, but optional for historical shots.I If any fields are absent or not formatted correctly, MIIS will ignore them but will still process the rest of the HL7 message, including any other repeats OBX segments.

SEQ	LEN	DT	R/RE/O	RP	TBL#	MIIS USAGE	ELEMENT NAME
1	**4**	**SI**	**R**	**N**		**Standard HL7**	**Set ID - OBX**
2	**2**	**ID**	**R**	**N**		**Standard HL7**	**Value Type**
3	80	CE	RE	N	NIP003	Standard HL7	Observation Identifier
4	20	ST	RE	N		Standard HL7	Observation Sub ID
5	60		RE	N	VFS	varies	Observation Value
11	**1**	**ID**	**R**	**N**		**Standard HL7**	**Observation Result Status**
14	**26**	**TS**	**R**	**N**		**Standard HL7**	**Date/Time of the Observation**

OBX-1 This field contains the sequence number. The first instance shall be set to 1 and each subsequent instance shall be the next number in sequence.

OBX-2 This field contains the format of the observation value in OBX. If the value is **CE** then the result must be a coded entry.

OBX-3 This field contains a unique identifier for the observation. The format is that of the Coded Element (CE). **Example: |30963-3^Vaccine purchased with^LN|**. Corresponding data type should be defined in OBX 2 and populated in OBX 5.

In most systems the identifier will point to a master observation table that will provide other attributes of the observation that may be used by the receiving system to process the observations it receives. This may be thought of as a question that the observation answers. In the example above, the question is "how was this immunization paid for". Refer to Observation Identifiers: OBX-3 (Subset of HL7 Table NIP003) for values.

MIIS Supported Values of OBX-3

CODE (OBX-3.1)	DESCRIPTION (OBX-3.2)	Corresponding data type (indicate in OBX-2)
29768-9	Date Vaccine Information Statement Published	(TS)
29769-7	Date Vaccine Information Statement Presented	(TS)
30963-3	Vaccine funding source	(CE)
30956-7	Vaccine type (vaccine group or family)	(CE)
38890-0	Component vaccine type*	(CE)
64994-7	Vaccine funding program eligibility category	(CE)

*Introduces one of x number of components in a single dose for which other Observations will follow:

Example: DTAP-HepB-IP

OBX-4 This field is used to group related observations by setting the value to the same number. For example, recording VIS date and VIS receipt date for a vaccination requires 3 OBX segments. One OBX would indicate the vaccine group. It would have a pair of OBX indicating the VIS publication date and the VIS receipt date. These would have the same OBX-4 value to allow them to be linked.

Example:

OBX|1|CE|38890-0^COMPONENT VACCINE TYPE^LN|**1**|45^HEP B, NOS^CVX||||||F|||20110705162431<CR>
OBX|2|TS|29768-9^DATE VACCINE INFORMATION STATEMENT PUBLISHED^LN|**1**|20010711||||||F|||20110705162431<CR>
OBX|3|TS|29769-7^DATE VACCINE INFORMATION STATEMENT PRESENTED^LN|**1**|19901207||||||F|||20110705162431<CR>

OBX-5 This field contains the value observed by the observation producer. OBX-2-value type contains the data type for this field according to which observation value is formatted. This field contains the value of OBX-3-observation identifier of the same segment. Depending upon the observation, the data type may be a number (e.g., dose number), a coded answer (e.g., a vaccine), or a date/time (the date/time that the VIS was given to the client/parent). An observation value is always represented as the data type specified in OBX-2-value type of the same segment. Whether numeric or short text, the answer shall be recorded in ASCII text. When an OBX segment contains values of CE data types, the observations are stored as a combination of codes and/or text. For values referencing vaccine funding source, see Observation Value: OBX-5 (Vaccine Funding Source only).

MIIS Supported Values of OBX-5

CODE (OBX-5.1)	DESCRIPTION (OBX-5.2)	DEFINITION	HL7 Table
CVX^Vaccine Description^ CVX	Component vaccine type*	The single antigen of a multi-antigen (component) vaccine	CVX
CVX^Group Name^CVX	Vaccine type (vaccine group or family)	The single component vaccine for this observation.	CVX
YYYYMMDD	Date VIS Presented	The date that the VIS for this single antigen of a multi-antigen vaccine was presented	None
YYYYMMDD	Date Vaccine Information Statement Published	The date that the VIS for this single antigen of a multi-antigen vaccine was published	None
PHC70	Private funds	Immunization was funded by private funds, including insurance.	CDCPHINVS
VXC2	State funds	Immunization was funded with public funds from a state.	CDCPHINVS

OBX-11 This field contains the observation result status. The expected value is F or final.

Required Default Value (OBX-11)	F

OBX-14 Records the time of the observation. It is the physiologically relevant date-time or the closest approximation to that date-time of the observation.

8.1.6 Sample OBX segment

IF Observation Identifier (OBX-3) is "**29768-9**", then the value in OBX-5 should be "**Date Vaccine Information Statement Published**".
IF Observation Identifier (OBX-3) is "**29769-7**", then the value in OBX-5 should be "**Date Vaccine Information Statement Presented**".
IF Observation Identifier (OBX-3) is "**30963-3**", then the value in OBX-5 should be "**Vaccine funding source**".

The following is a sample OBX message for a combination vaccine and a description of the data that will be captured in the MIIS.

RXA|0|1|20140303000000||110^DTaP-Hep B-IPV^CVX|0.5|mL^MilliLiter [SI Volume Units]^UCUM||00^New Immunization Record^NIP001| NPI001^LastName^ClinicianFirstName |||||7537C|20160417|SKB^Glaxo (GSK)^MVX|||CP|A
RXR|IM^Intramuscular^HL70162|RT^Right Thigh^HL70163
OBX|1|CE|30963-3^Vaccine funding source^LN|1|VXC2^State funds^CDCPHINVS||||||F|||20140303000000
OBX|2|CE|64994-7^Vaccine funding program eligibility category^LN|1|V01^Not VFC^HL70064||||||F|||20120901041038
OBX|3|CE|30956-7^Vaccine type (vaccine group or family)^LN|1|45^Hep B, unspecified manufacturer^CVX||||||F|||20140303000000
OBX|4|TS|29769-7^Date Vaccine Information Statement Presented^LN|1|20140303||||||F|||20140303000000
OBX|5|TS|29768-9^Date Vaccine Information Statement Published^LN|1|20080918||||||F|||20140303000000
OBX|6|CE|30956-7^Vaccine type (vaccine group or family)^LN|2|89^Poliovirus, unspecified manufacturer^CVX||||||F|||20140303000000
OBX|7|CE|64994-7^Vaccine funding program eligibility category^LN|1|V01^Not VFC^HL70064||||||F|||20120901041038
OBX|8|TS|29769-7^Date Vaccine Information Statement Presented^LN|2|20140303||||||F|||20140303000000
OBX|9|TS|29768-9^Date Vaccine Information Statement Published^LN|2|20090318||||||F|||20140303000000
OBX|10|CE|30956-7^Vaccine type (vaccine group or family)^LN|3|107^DTaP, unspecified manufacturer^CVX||||||F|||20140303000000
OBX|11|CE|64994-7^Vaccine funding program eligibility category^LN|1|V01^Not VFC^HL70064||||||F|||20120901041038
OBX|12|TS|29769-7^Date Vaccine Information Statement Presented^LN|3|20140303||||||F|||20140303000000
OBX|13|TS|29768-9^Date Vaccine Information Statement Published^LN|3|20131114||||||F|||20140303000000

In this example, the combination vaccine “DTAP-HepB-IPV” has multiple OBX segments. The MIIS will first identify all those OBX segments that belong to the HepB component of the combination vaccine. Those segments are identified by the Observation Sub ID, which in this case for HepB is “1”.

OBX|3|CE|30956-7^Vaccine type (vaccine group or family)^LN|1|45^Hep B, unspecified manufacturer^CVX||||||F|||20140303000000

Next, the MIIS will capture the OBX segments associated with Polio, followed by DTAP.

9 Appendix I: HL7 and User-Defined Tables

The following section presents vocabulary and code tables used in VXU_V04 2.5.1 messages processed by the MIIS. Only the values listed here are processed by the MIIS. Tables that contain only a selection of values described in the HL7 2.5.1 Implementation Guide are marked as a "subset" in the title, with the reference to the full table). User-defined tables present values defined by the MIIS.

9.1 Patient/Caregiver Name Type: PID-5 or NK1-2 (HL7 Table 0200)

In PID-5 or in NK1-2 only value shown in the table should be used in PID-5.7 or NK1-2.7.

VALUE (PID-5.7 or NK1-2.7)	DESCRIPTION	DEFINITION
A	Alias name	This is a nickname or other assumed name.
L	Legal name	This is a person's official name. It is the primary name recorded in the IIS.
D	Display name	This is the preferred name displayed on a user interface.
M	Maiden name	This is a woman's name before marriage.
C	Adopted name	This is the name of a person after adoption.
B	Name at birth	This is name recorded at birth (prior to adoption).
P	Name of partner/spouse	This is the name of the partner or spouse.
U	Unspecified	This is a name of unspecified type.

9.2 Next of Kin Relationship: NK1-3 (Subset of HL7 Table 0063)

NK1-3 is a CE data type; a triplet of values should be used, if available. In NK1-3 both value (NK1-3.1) and description (NK1-3.2) should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (NK1-3.3). Suggested value is "HL70063".

VALUE (NK1-3.1)	DESCRIPTION (NK1-3.2)
BRO	Brother
CGV	Care giver
CHD	Child
FCH	Foster child
FTH	Father
GRD	Guardian
GRP	Grandparent
MTH	Mother
OTH	Other
PAR	Parent
SCH	Stepchild
SEL	Self

VALUE (NK1-3.1)	DESCRIPTION (NK1-3.2)
SIB	Sibling
SIS	Sister
SPO	Spouse

9.3 Administrative Sex: PID-8 (HL7 Table 0001)

In PID-8 only value shown in the table should be used.

VALUE (PID-8)	DESCRIPTION
F	Female
M	Male
U	Unknown/Undifferentiated

9.4 Race: PID-10 (HL7 Table 0005)

PID-10 is a CE data type; a triplet of values should be used, if available. In PID-10 both value (PID-10.1) and description (PID-10.2) should be used.

VALUE (PID-10.1)	DESCRIPTION (PID-10.2)
1002-5	American Indian or Alaska Native
2028-9	Asian
2076-8	Native Hawaiian or Other Pacific Islander
2054-5	Black or African-American
2106-3	White
2131-1	Other Race
<empty field>	Unknown/undetermined

9.5 Patient Address Type: PID-11 (HL7 Table 0190)

In PID-11 only value (PID-11.7) shown in the table should be used.

VALUE (PID-11.7)	DESCRIPTION
C	Current or temporary
P	Permanent
M	Mailing
B	Firm/Business
O	Office
H	Home
N	Birth (nee)
F	Country of origin
L	Legal address
BDL	Birth delivery location [*use for birth facility*]
BR	Residence at birth [*use for residence at birth*]
RH	Registry home

VALUE (PID-11.7)	DESCRIPTION
BA	Bad address

9.6 Telecommunication Use Code: PID-13.2 (HL7 Table 0201)

In PID-13 only value (PID-13.2) shown in the table should be used.

VALUE (PID-13.2)	DESCRIPTION
PRN	Primary Residence Number
ORN	Other Residence Number
WPN	Work Number
VHN	Vacation Home Number
ASN	Answering Service Number
EMR	Emergency Number
PRS	Personal
NET	Email

9.7 Telecommunication Equipment Type: PID-13.3 (HL7 Table 0202)

In PID-13 only value (PID-13.2) shown in the table should be used.

VALUE (PID-13.2)	DESCRIPTION
PH	Telephone
CP	Cellular or Mobile Phone
X.400	X.400 email address

9.8 Ethnic Group: PID-22 (HL7 Table 0189)

PID-22 is a CE data type; a triplet of values should be used, if available. In PID-22 both value (PID-22.1) and description (PID-22.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (PID-22.3). Suggested value is "HL7".

VALUE (PID-22.1)	DESCRIPTION (PID-22.2)
2135-2	Hispanic or Latino
2186-5	not Hispanic or Latino
Empty. Do not value.<empty field>	Unknown

9.9 Publicity Code: PD1-11 and NK1-22 (Subset of HL7 Table 0215)

PD1-11 and NK1-22 are both a CE data type; a triplet of values should be used, if available. Both value (PD1-11.1 or NK1-22.1) and description (PD1-11.2 or NK1-22.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (PD1-11.3 or NK1-22.3). Suggested value is "HL70215".

VALUE (PD1-11.1 or NK1-22.1)	DESCRIPTION (PD1-11.2 or NK1-22.2)
01	No reminder/recall
02	Reminder/recall - any method
03	Reminder/recall - no calls
04	Reminder only - any method
05	Reminder only - no calls
06	Recall only - any method
07	Recall only - no calls
08	Reminder/recall - to provider
09	Reminder to provider
10	Only reminder to provider, no recall
11	Recall to provider
12	Only recall to provider, no reminder

9.10 Yes/No Death Indicator: PID-30 (HL7 Table 0136)

In PID-30 only value shown in the table should be used.

VALUE (PID-30)	DESCRIPTION
Y	Yes
N	No

9.11 Immunization Registry Status: PD1-16 (HL7 Table 0441)

In PD1-16 only value shown in the table should be used.

VALUE (PD1-16)	DESCRIPTION
A	Active
I	Inactive--Unspecified
L	Inactive-Lost to follow-up (cannot contact)
M	Inactive-Moved or gone elsewhere (transferred)
P	Inactive-Deceased
U	Unknown

9.12 Insurance Company Name: IN1-3 (User-defined table UD01)

In IN1-3.3 only value shown in the table should be used.

IN1-3.1	Insurer Description	Type of Insurance
Blank	Unknown	Unknown
0	No Health Insurance	Uninsured
1	Mass Health	Mass Health
2	BlueCross and BlueShield of MA	Private Insurance
3	Harvard Pilgrim Health Care	Private Insurance
4	Tufts Associated Health Plan	Private Insurance
5	Connecticut General Life Ins	Private Insurance
6	Total Health Plan, Inc.	Private Insurance
7	Unicare Life and Health Insurance	Private Insurance
8	Aetna Inc.	Private Insurance
9	Fallon Community Health Plan	Private Insurance
10	United Healthcare Ins. Co.	Private Insurance
11	Health New England, Inc.	Private Insurance
12	Tufts Benefit Administrators Inc	Private Insurance
13	Mass. State Carpenters Health Benefits Fund	Private Insurance
14	Health Plans, Inc.	Private Insurance
15	United Healthcare Service Corp	Private Insurance
16	CIGNA HealthCare of Massachusetts	Private Insurance
17	Massachusetts Labors' Health and Welfare Fund	Private Insurance
18	United Healthcare Of New England	Private Insurance
19	Neighborhood Health Plan	Private Insurance
20	Guardian Life Ins Co of America	Private Insurance
21	Blue Cross & Blue Shield of Rhode Island	Private Insurance
22	London Health Administrators, LTD	Private Insurance
23	I.B.E.W. Health Benefit Plan	Private Insurance
24	Great-West Life and Annuity Insurance Co.	Private Insurance
25	Chickering Claims Administrator	Private Insurance
26	MED TAC Corporation	Private Insurance
27	Comprehensive Benefits Administrator Inc	Private Insurance
28	Group Insurance Service Center Inc	Private Insurance
29	Pioneer Management Systems	Private Insurance
30	I U O E LOCAL 4	Private Insurance

31	Medicare	Medicare
99	Other Private Insurance	Private Insurance

9.13 Financial Class: PV1-20 and OBX-5 (HL7 Table 0064)

In PV1-20.1 and OBX: only value shown in the table should be used.

VALUE (PV1-20)	LABEL	DEFINITION
V01	Not VFC eligible	Client does not qualify for VFC because they do not have one of the statuses below. This category does not include the underinsured (see V08).
V02	VFC eligible - Medicaid/Medicaid Managed Care	Client is currently on Medicaid or Medicaid managed care.
V03	VFC eligible - Uninsured	Client does not have insurance coverage for vaccinations.
V04	VFC eligible - American Indian/Alaskan Native	Client is a member of a federally recognized tribe.
V05	VFC eligible - Federally Qualified Health Center Patient (under-insured)	Client has insurance that partially covers vaccines received on visit and so is eligible for VFC coverage at a Federally Qualified Health Center. The client must be receiving the immunizations at the FQHC.
V06	Deprecated	Do not use
V07	Deprecated	Do not use
V08	Deprecated	Do not use

9.14 CVX Code: RXA-5 (User-defined table UD02)

RXA-5 is a CE data type; a triplet of values should be used, if available. In RXA-5 both code (RXA-5.1) and vaccine name (RXA-5.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (RXA-5.3). Suggested value is "CVX". For vaccines currently being administered, only active codes (ACTIVE = Y) should be used; others may be used for historic shots.

CODE (RXA-5.1)	VACCINE NAME (RXA-5.2)	ACTIVE?
54	Adenovirus, type 4	Y
55	Adenovirus, type 7	Y
82	Adenovirus, unspecified formulation	N
24	Anthrax	Y
19	BCG	Y
27	Botulinum antitoxin	Y

CODE (RXA-5.1)	VACCINE NAME (RXA-5.2)	ACTIVE?
26	Cholera	Y
29	CMV-IgIV	Y
56	Dengue Fever	N
12	Diphtheria-antitoxin	Y
20	DTaP	Y
106	DTaP,5 pertussis antigens	Y
146	DTaP,IPV,Hib,HepB	N
107	DTaP,unspecified formulation	N
110	DTAP-HepB-IPV	Y
50	DTaP-Hib	Y
120	DTaP-Hib-IPV	Y
130	DTaP-IPV	Y
132	DTaP-IPV-Hib-Hep B, historical	N
1	DTP	N
28	DT-Peds	Y
22	DTP-Hib	N
102	DTP-Hib-HepB	N
998	DUMMY	Y
88	Flu, unspecified formulation	N
151	Influenza nasal, unspecified formulation	N
153	Influenza, injectable, MDCK, preservative free	Y
160	Influenza A monovalent (H5N1), adjuvanted-2013	Y
127	Flu-H1N1 -TIV	N
125	Flu-H1N1-LAIV	N
126	Flu-H1N1-TIV-preservative-free	N
128	Flu-H1N1-unspecified formulation	N
123	Flu-H5N1-1203	Y
801	AS03 Adjuvant (packaged with H5N1 vaccine, adjuvanted)	Y
135	Flu-High Dose	Y
150	Flu-IIV4, preservative-free	Y
158	Flu-IIV4	
161	Flu-IIV4 Peds, preservative-free	Y
166	Flu-IIV4-ID	Y
15	Flu, split (incl. purified surface antigen)	N
149	Flu-LAIV, quadrivalent	Y
111	Flu-LAIV	N
155	Flu-RIV3, preservative-free	Y
141	Flu-TIV	Y

CODE (RXA-5.1)	VACCINE NAME (RXA-5.2)	ACTIVE?
16	Flu-TIV, whole virus	N
144	Flu-TIV-ID	Y
140	Flu-TIV-preservative-free	Y
57	Hantavirus	N
30	HBIg	Y
31	Hep A Peds, unspecified formulation	N
58	Hep C	N
59	Hep E	N
85	HepA, unspecified formulation	N
154	Hep A, IG Long Name: Hepatitis A immune globulin	Y
52	HepA-Adult	Y
104	HepA-HepB Adult	Y
83	HepA-Peds 2 Dose	Y
84	HepA-Peds 3 Dose	N
43	HepB Adult	Y
45	HepB, unspecified formulation	N
42	HepB-adolescent/HR infant	N
44	HepB-Dialysis 3 Dose	Y
51	HepB-Hib	Y
8	HepB-Peds	Y
60	Herpes Simplex Virus, Type 2	N
17	Hib, unspecified formulation	N
47	Hib-HbOC	Y
49	Hib-OMP	Y
46	Hib-PRP-D	N
48	Hib-PRP-T	Y
61	HIV	N
118	HPV2	Y
62	HPV4	Y
137	HPV, unspecified formulation	N
165	HPV9	Y
86	Ig	Y
14	IG, unspecified formulation	Y
87	IgIV	Y
10	IPV	Y
134	Japanese Encephailits-IM	Y
39	Japanese Encephailits-SC (JE-VAX)	N
129	Japanese encephalitis, unspecified formulation	N
63	Junin Virus	N

CODE (RXA-5.1)	VACCINE NAME (RXA-5.2)	ACTIVE?
64	Leishmaniasis	N
65	Leprosy	N
66	Lyme	N
67	Malaria	N
147	MCV4, unspecified formulation	N
136	MCV4-Menveo	Y
114	MCV-Menactra	Y
5	Measles	Y
4	Measles-Rubella	N
68	Melanoma	N
103	Meningococcal C conjugate	N
148	Meningococcal C/Y-HIB PRP	Y
108	Meningococcal, unspecified formulation	N
162	MenB-FHbp	Y
163	MenB-4C	Y
164	MenB-unspecified	N
3	MMR	Y
94	MMRV	Y
32	MPSV4	Y
7	Mumps	Y
2	OPV	N
69	Parainfluenza-3	N
133	PCV13	Y
100	PCV7	Y
11	Pertussis	N
23	Plague	N
109	Pneumococcal, unspecified formulation	N
152	Pneumococcal Conjugate, unspecified formulation	Y
89	Polio, unspecified formulation	N
33	PPSV23	Y
70	Q Fever	N
90	Rabies,unspecified formulation	N
40	Rabies-ID	Y
18	Rabies-IM	Y
72	Rheumatic Fever	N
156	Rho(D)-IgIV	Y
157	Rho(D)-IgIM	Y
159	Rho(D)- unspecified formulation	N
73	Rift Valley Fever	N

CODE (RXA-5.1)	VACCINE NAME (RXA-5.2)	ACTIVE?
34	RIg	Y
119	Rotavirus, monovalent	N
116	Rotavirus, pentavalent	Y
74	Rotavirus, tetravalent	N
122	Rotavirus, unspecified formulation	N
71	RSV-IgIV	Y
93	RSV-Mab	Y
145	RSV-MAb - respiratory syncytial virus monoclonal antibody (motavizumab), intramuscular	N
6	Rubella	Y
38	Rubella-Mumps	N
76	Staph	N
9	Td	Y
138	Td (not adsorbed)	Y
139	Td, unspecified formulation	N
115	Tdap	Y
113	Td-preservative free	Y
35	Tetanus toxoid, adsorbed	Y
142	Tetanus toxoid, not adsorbed	Y
112	Tetanus toxoid, unspecified formulation	Y
77	Tick Borne Encephalitis	N
13	TIg	Y
78	Tularemia	N
91	Typhoid, unspecified formulation	N
53	Typhoid-AKD (Military)	Y
41	Typhoid-HP	Y
25	Typhoid-Oral	Y
101	Typhoid-ViCPs	Y
131	Typhus, Historical	N
999	Unknown vaccine or immune globulin	Y
75	Vaccinia (smallpox)	Y
105	Vaccinia (smallpox), diluted	N
79	Vaccinia immune globulin VIG	Y
21	Varicella	Y
80	Venezuelan encephalitis attenuated	N
81	Venezuelan encephalitis inactivated	N
92	Venezuelan encephalitis unspecified formulation	N
36	VZIg	Y
117	VZIG (IND)	N

CODE (RXA-5.1)	VACCINE NAME (RXA-5.2)	ACTIVE?
37	Yellow Fever	Y
121	Zoster	Y

9.15 Immunization Information Source: RXA-9 (HL7 NIP001 table)

RXA-9 is a CE data type; a triplet of values should be used, if available. In RXA-9 both value (RXA-9.1) and description (RXA-9.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (RXA-9.3). Suggested value is "HL7".

VALUE (RXA-9.1)	DESCRIPTION
00	New immunization record
01	Historical information - source unspecified
02	Historical information - from other provider
03	Historical information - from parent's written record
04	Historical information - from parent's recall
05	Historical information - from other registry
06	Historical information - from birth certificate
07	Historical information - from school record
08	Historical information - from public agency

9.16 Substance Manufacturer Name: RXA-17 (HL7 table 0227)

RXA-17 is a CE data type; a triplet of values should be used, if available. In RXA-17 both value (RXA-17.1) and description (RXA-17.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (RXA-17.3). Suggested value is "HL70227". For current vaccines, only active codes (ACTIVE = Y) should be used.

VALUE (RXA-17.1)	DESCRIPTION (RXA-17.2)	ACTIVE?
AB	Abbott Laboratories (Ross Products Division)	Y
ACA	Acambis, Inc	Y
AD	Adams Laboratories, Inc.	Y
AKR	Akorn, Inc	Y
ALP	Alpha Therapeutic Corporation	Y
AR	Armour	N
AVB	Aventis Behring L.L.C.	N
AP	Aventis Pastuer	N
AVI	Aviron	N
BRR	Barr Laboratories	Y
BA	Baxter Healthcare Corporation	N
BAH	Baxter Healthcare Corporation (includes North America Vaccine, Inc)	Y
BAY	Bayer (Including Miles And Cutter)	Y
BPC	Berna (Including Swiss Serum And Vib)	Y

VALUE (RXA-17.1)	DESCRIPTION (RXA-17.2)	ACTIVE?
BP	Berna Products	N
SCL	Biocene Sclavo	Y
MIP	Bioport Corporation	Y
BTP	Biotest Pharmaceuticals Corporation	Y
CDH	California Department of Health Services	Y
CNJ	Cangene	Y
CMP	Celltech Medeva Pharmaceuticals	N
CEN	Centeon (Including Armour Pharm)	N
CHI	Chiron Corporation (A business of Novartis)	N
CON	Connaught	N
CSL	CSL Biotherapies	Y
DVC	DynPort Vaccine Company, LLC	Y
EVN	Evans Medical Limited	N
GB	Genesis Biopharm	Y
GEO	GeoVax Labs, Inc.	Y
GRF	Grifols	Y
SKB	GlaxoSmithKline	Y
GSK	GlaxoSmithKline (SmithKline Beecham and Glaxo Wellcome)	Y
GRE	Greer Laboratories Inc.	Y
IAG	Immuno International Ag	N
IDB	ID Biomedical	Y
IUS	Immuno-U.S., Inc.	Y
INT	Intercell Biomedical	Y
JNJ	Johnson and Johnson	
KED	Kedrian Biopharma	Y
KGC	Korea Green Cross Corporation	Y
LED	Lederle	N
MBL	Massachusetts Biologic Laboratories	Y
MA	Massachusetts Public Health Biologic Lab (inactive use MBL)	Y
MCM	MCM Vaccine Company	Y
MED	MedImmune, Inc.	Y
MIP	Emergent BioDefense Operations Lansing	Y
MSD	Merck & Co., Inc.	Y
IM	Merieux	N
MIL	Miles	N
NAB	NABI (formerly North American Biologicals, Inc)	Y
NYB	New York Blood Center	Y
NAV	North American Vaccine, Inc.	N
NOV	Novartis Vaccines (Chiron, Ciba-Geigy, Sandoz, PowderJect, Celltech Medeva, Evans)	Y
NVX	Novavax, Inc.	Y
OTC	Organon Teknika Corporation	Y
ORT	Ortho-Clinical Diagnostics	Y

VALUE (RXA-17.1)	DESCRIPTION (RXA-17.2)	ACTIVE?
JPN	Osaka University (Biken)	Y
OTH	Other Manufacturer	Y
PAX	PaxVax	Y
PD	Parkedale Pharmaceuticals (formerly Parke Davis)	Y
PFR	Pfizer	Y
PFI	Pfizer (formerly Wyeth, Wyeth Ayerst, Lederle and Praxis)	Y
PWJ	PowderJect Pharmaceuticals	N
PRX	Praxis Biologics	N
PSC	Protein Sciences	Y
PMC	Sanofi Pasteur	Y
SAN	sanofi pasteur (formerly Sanofi Pasteur, formerly Aventis Pasteur Inc., Connaught and Pasteur Merieux)	N
SKB	GlaxoSmithKline	Y
SOL	Solvay Pharmaceuticals	Y
SI	Swiss Serum and Vaccine Inst.	N
TAL	Talecris (includes Bayer Biologics)	Y
USA	U.S. Army Med Research	Y
UNK	UNKNOWN	Y
VXG	VaxGen	Y
WA	Wyeth-Ayerst	N
WAL	Wyeth-Ayerst	N
ZLB	ZLB Behring	N

9.17 Substance/Treatment Refusal Reason: RXA-18 (HL7 NIP002 table)

RXA-18.1is a CE data type; a triplet of values should be used, if available. In RXA-18 both value (RXA-18.1) and description (RXA-18.2) shown in the table should be used. Refer to Coding System (Table NIP002) for options for the 3rd sequence (RXA-18.3). Suggested value is "HL7".
If the RXA-18 is populated, then the system shall require that RXA-20 have a value of "RE" for refused.

VALUE (RXA-18.1)	DESCRIPTION
00	Parental Decision
01	Religious Exemption
02	Other
03	Patient Decision

9.18 Completion Status: RXA-20 (HL7 Table 0322)

In RXA-20 only the value shown in the table should be used.

RXA-20.1is a CE data type; a triplet of values should be used, if available. In RXA-20 both value (RXA-20.1) and description (RXA-20.2) shown in the table should be used. Refer to Coding System (Table NIP002) for options for the 3rd sequence (RXA-20.3). Suggested value is "HL7".

VALUE (RXA-20)	DESCRIPTION
CP	Complete
RE	Refused
NA	Not Administered*
PA	Partially Administered

9.19 Action Code: RXA-21 (HL7 Table 0323)

In RXA-21 only the value shown in the table should be used.

RXA-21.1is a CE data type; a triplet of values should be used, if available. In RXA-20 both value (RXA-21.1) and description (RXA-21.2) shown in the table should be used. Refer to Coding System (Table NIP002) for options for the 3rd sequence (RXA-21.3). Suggested value is "HL7".

VALUE (RXA-21)	DESCRIPTION
A	Add
U	Update
D	Delete

9.20 Route: RXR-1 (HL7 Table 0162)

RXR-1 is a CE data type; a triplet of values should be used, if available. In RXR-1 both code (RXR-1.1) and value (RXR-1.2) should be used. The MIIS accepts coded values from either the FDA/HCIT "C" codes or the standard HL7 codes listing below.

Using FDA/NCIT Coding

Example: RXR|**C38299^SC^NCIT**|RT||||

Suggested value of RXR-1.3 is "NCIT"

CODE (RXR-1.1) RXR-1.1	VALUE RXR-1.2	DESCRIPTION Informational only
C38238	ID	Intradermal
C28161	IM	Intramuscular
C38284	NS	Nasal
C38284	IN	Intranasal
C38276	IV	Intravenous
C38288	PO	Oral
C38676	OTH	Other/Miscellaneous
C38676	OTH	Percutaneous
C38299	SC	Subcutaneous
C38305	TD	Transdermal

Using HL7 coding
Example: RXR|**ID^ Intradermal ^HL7**|RT||||
Suggested value of RXR-1.3 is "HL70162".

VALUE RXR-1.1	DESCRIPTION RXR-1.2
ID	Intradermal
IM	Intramuscular
NS	Nasal
IN	Intranasal
IV	Intravenous
PO	Oral
OTH	Other/Miscellaneous
OTH	Percutaneous
SC	Subcutaneous
TD	Transdermal

9.21 Administration Site: RXR-2 (HL7 Table 0163)

RXR-2 is a CE data type; a triplet of values should be used, if available. In RXR-2 both value (RXR-2.1) and description (RXR-2.2) shown in the table should be used. Refer to Coding System (HL7 Table 0396) for options for the 3rd sequence (RXR-1.3). Suggested value is "HL70163".

VALUE (RXR-2.1)	DESCRIPTION (RXR-2.2)
LT	Left Thigh
LA	Left Upper Arm
LD	Left Deltoid
LG	Left Gluteus Medius
LVL	Left Vastus Lateralis
LLFA	Left Lower Forearm
RA	Right Upper Arm
RT	Right Thigh
RVL	Right Vastus Lateralis
RG	Right Gluteus Medius
RD	Right Deltoid
RLFA	Right Lower Forearm

9.22 Accept Acknowledgment Type: MSH-15 (HL7 Table 0155)

In MSH-15 only the value shown in the table should be used.

VALUE (MSH-15)	DESCRIPTION
AL	Always
NE	Never
ER	Error/Reject conditions only
SU	Successful completion only

9.23 Observation Identifiers: OBX-3 (Subset of HL7 Table NIP003)

OBX-3 is a CE data type; a triplet of values should be used, if available. In OBX-3, code (OBX-3.1), description (OBX-3.2), and Coding System (HL7 Table 0396) (OBX-3.3) should be used.

CODE (OBX-3.1)	DESCRIPTION (OBX-3.2)	Corresponding data type (indicate in OBX-2)
29768-9	Date Vaccine Information Statement Published	(TS)
29769-7	Date Vaccine Information Statement Presented	(TS)
30963-3	Vaccine funding source	(CE)
30956-7	Vaccine type (vaccine group or family)	(CE)
38890-0	Component vaccine type	(CE)
64994-7	Vaccine funding program eligibility category	(CE)

9.24 Observation Value: OBX-5 (Vaccine Funding Source only)

OBX-5 is a CE data type; a triplet of values should be used, if available. In OBX-5, code (OBX-5.1), description (OBX-5.2), and HL7 Table 0396 Code (OBX-5.3) shown in the table should be used. Although this table has multiple values, only Private or State funds are valid for Massachusetts.

CODE (OBX-5.1)	DESCRIPTION (OBX-5.2)	DEFINITION	HL7 Table 0396 Code (OBX-5.3)
PHC70	Private funds	Immunization was funded by private funds, including insurance.	CDCPHINVS
VXC2	State funds	Immunization was funded with	CDCPHINVS

CODE (OBX-5.1)	DESCRIPTION (OBX-5.2)	DEFINITION	HL7 Table 0396 Code (OBX-5.3)
		public funds from a state.	

9.25 Acknowledgement Code: MSA-1 (Subset of HL7 Table 0008)

In MSA-1 only the value shown in the table should be used.

VALUE (MSA-1)	DESCRIPTION
AA	Application Accept
AE	Application Accept with Error
AR	Application Reject

10 Appendix II: Master List of MIIS Data Fields

This table shows data fields available in the Massachusetts Immunization Information System, and where they would appear in the corresponding HL7 segments.

PLEASE NOTE:
Both usage codes of R and RE indicate Required Data. If any RE fields are not available on your EHR, please advise MDPH.

MIIS DATA FIELD	USAGE	HL7 SEGMENT
Address Type (Client's)	**RE**	PID-11
Administered By	**RE**	RXA-10
Administration Route	**R**	**RXR-1**
Administration Site	**RE**	RXR-2
Alias (Client's)	**RE**	PID-9
Applied Date (Clinical Comments)		N/A
Birth Certificate Number	Birth record only	N/A
Birth City	Birth record only	N/A
Birth Country	Birth record only	N/A
Birth Date	**R**	**PID-7**
Birth Facility	Birth record only	N/A
Birth Order	Birth record only	N/A
Caregiver City	RE	NK1-4
Caregiver First Name	**R (if populated)**	**NK1-2**
Caregiver Last Name	**R (if populated)**	**NK1-2**
Caregiver Middle Name	**RE**	NK1-2
Caregiver Phone1	**RE**	NK1-5
Caregiver Phone2	**RE**	NK1-5
Caregiver State	**RE**	NK1-4
Caregiver Street Address	**RE**	NK1-4
Caregiver Type	**RE**	NK1-3
Caregiver Zip Code	**RE**	NK1-4
Death Date	**RE**	PID-29
Dose Validity		N/A
Email (Client's)	**RE**	PID-13
Ethnicity (Client's)	**RE**	PID-22
First Name (Client's)	**R**	**PID-5**
Gender (Client's)	**RE**	PID-8
Historical Shot?	**RE**	RXA-9

MIIS DATA FIELD	USAGE	HL7 SEGMENT
Incomplete Dose?	**RE**	RXA-20
Insurer	**RE**	IN1-3, IN1-4
Is State Supplied?	**RE**	OBX-5
Last Name (Client's)	**R**	**PID-5**
Lot Number	**RE**	RXA-15
Middle Name	**RE**	PID-5
Mother's DOB	Birth record only	N/A
Mother's First Name	**RE**	NK1-2
Mother's Home Telephone	**RE**	NK1-5
Mother's Last Name	**RE**	NK1-2
Mother's Middle Name	**RE**	NK1-2
Mother's Maiden Name	**RE**	PID-6
MRN	**R**	**PID-3**
MRN Facility	RE	PD1-3
Multiple Birth	Birth record only	N/A
Patient Status (Provider Level)	RE	PD1-16
PCP	O	PD1-4
Phone1 (Client's)	**RE**	PID-13
Phone2 (Client's)	**RE**	PID-13
Publicity Code	**RE**	PD1-11
Race (Client's)	**RE**	PID-10
Receive Reminder/Recall? (Caregiver)	O	NK1-22
State (Client's)	**RE**	PID-11
Street Address (Client's)	**RE**	PID-11
Suffix (Client's)	**RE**	PID-5
Vaccine Date Given	**R**	**RXA-3**
Vaccine Dose	**R**	**RXA-6**
Vaccine Group		N/A
Vaccine Manufacturer	**RE**	RXA-17
Vaccine Name	**R**	**RXA-5**
Vaccine Trade Name		N/A
VFC Eligibility	**RE**	PV1-20 and OBX
VFC Status	**RE**	PV1-20
VIS Given Date	**RE**	OBX-5
VIS Publication Date	**RE**	OBX-5
Zip Code (Client's)	**RE**	PID-11

11 Appendix V: Soap Web Services Transport Instructions

11.1 Connectivity Options

Soap web services is the preferred method of transport. If you are unable to use this method, the Mass HIway also offers connectivity through LAND (Local Adaptor for Network Devices). Please contact the Mass HIway directly for more information on connectivity via LAND at: MassHIWaySupport@MassMail.State.MA.US

11.2 Message Construction and Testing

Before testing, review the MIIS Testing Guidelines, Sample Message and Transfer specifications. https://www.contactmiis.info/ehrIntegration.asp

11.3 WSDL Setup

The Massachusetts Immunization Information System uses a standard WSDL format, as recommended by the CDC. The WSDL is also available for download from the link below. Click on the "CDC Certification" WSDL to download the WSDL Project zip file. For instructions on how to use the WSDL, click on the link "Transport Instruction for SOAP Web Services".

https://www.contactmiis.info/ehrIntegration.asp

11.4 Acknowledgement and Response

The Acknowledgment will need to be base-64 decoded by the receiving system.

```
<soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope">
  <soapenv:Body>
    <urn:submitSingleMessageResponse xmlns:urn="urn:cdc:iisb:2011">
<urn:return>TVNIfF5+XCZ8TUlJU3w5OTk5MHxFSFJ8MTIzNDV8MjAxNTAzMzExNTA3NDB8fEFDS15WMDReQUNLfEFDSy0yMDE1MDMzMS0xNTA3NDAtMDg5fFB8Mi41LjENTVNBfEFBfE1TRy5WYWxpZF8wMQ1FUlJ8fF5eXl5efDBeTWVzc2FnZSBhY2NlcHRlZAo=</urn:return>
    </urn:submitSingleMessageResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

11.5 Sample Acknowledgments

Successful Acknowledgment: AA

```
MSH|^~\&|MIIS|99990|SiteName|12928|20150331150017||ACK^V04^ACK|ACK-20150331-150017-259|P|2.5.1
```

MSA|**AA**|9298520150331145000
ERR||^^^^^|0^Message accepted

Message accepted with errors: AE

MSH|^~\&|MIIS|99990|SiteName|13164|20150331140015||ACK^V04^ACK|ACK-20150331-140015-649|P|2.5.1
MSA|**AE**|123955720150331123400
ERR||RXA^10^^^^|101^Required field missing|W|7^required data missing|||Administering Provider is missing.
ERR||RXA^17^1^^^|101^Required field missing|W|7^required data missing|||Substance Manufacturer Name is missing.
ERR||^^^^^|0^Message accepted

Error Acknowledgment: AR*

MSH|^~\&|MIIS|99990|EHR|12345|20150327140433||ACK^V04^ACK|ACK-20150327-140433-851|P|2.5.1
MSA|**AR**|MSG.Valid_01
ERR||^^^^^|207^Application internal error|E|8^Data was ignored|||MSG_402. MIIS HL7 SERVICE ERROR please review the HL7 message that was sent to confirm it is formatted in accordance with the Massachusetts DPH HL7 Transfer Specifications. After this review, please try to resend the message. If this error continues, contact the MDPH MIIS Help Desk.

*AR responses are typically due to malformatted HL7 messages and/or missing or invalid required fields.